MW & BC FUNDED PROJECTS
(MSU and other)
By Title and Summary
for FY91-92

TITLE: The Role and Importance of New Initiatives in Multiple Peril Crop Insurance to Montana Producers

INSTITUTION: Montana State University

DEPARTMENT: Ag Econ/ Econ Department

RESEARCHERS: Alan E. Banquet (Leader)
Vincent H. Smith
Myles J. Watts

FUNDED AMOUNT: ($15,000)

OBJECTIVES:

1. Identify the impact of new Multiple Peril Crop Insurance Policy initiatives on the level and variability of revenues received by Montana producers.

2. Identify strengths, weaknesses and areas of improvement for multiple peril crop insurance as it applies to Montana producers, especially with respect to the role of private insurers.

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TITLE: Economic Comparison of Spring Wheat and Safflower Produced Using Conventional Weed Control and Chemical-free Weed Control

INSTITUTION: Montana State University/Ag Experiment Station

DEPARTMENT: Eastern Agricultural Research Center/Sidney, MT

RESEARCHERS: Joyce L. Eckoff (Leader)
Jerald W. Bergman

FUNDED AMOUNT: ($4,000)

OBJECTIVES:

1. To evaluate the economics of chemical-free spring wheat and safflower production.

2. To compare yield and quality of spring wheat and safflower grown using conventional herbicides with yield and quality of spring wheat and safflower grown under chemical-free conditions.

3. To initiate research at EARC on sustainable agriculture and chemical-free crop production.

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TITLE: Development of Barley Varieties Adapted to Montana

INSTITUTION: Montana State University

DEPARTMENT: Department of Plant & Soil Sciences

RESEARCHERS: Tom Blake (Leader)
Pat Hensleigh

FUNDED AMOUNT: ($50,000)

OBJECTIVES:

1. Development of two-rowed feed and malting varieties with improved yield, quality, and dryland adaptation.

2. Development of two-rowed stiff strawed high test weight, high yield potential barley varieties for production under irrigation.

3. Development of a germplasm base of six-rowed lines with potential for high yield and (eventually) malting quality.

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TITLE: Development of Molecular Markers for Barley

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Tom Blake (Leader)
Vladimire Kanazin
Somvong Tragoonrung
Peng Chee

FUNDED AMOUNT: ($25,000)

OBJECTIVES:

1. Development of DNA based marker systems which will permit the rapid and efficient marking of both specific cultivars and specific genes.

2. Using these markers to a) mark Montana varieties for potential PVP and b) marking RWA and smut resistance genes to permit their rapid movement into Montana barley varieties.

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TITLE: Marketing and Risk Management Education for Montana Grain Producers

INSTITUTION: Montana State University

DEPARTMENT: Agricultural Economics and Economics

RESEARCHERS: David W. Bullock (Leader)
Alan E. Banquet
Duane A. Griffith

FUNDED AMOUNT: ($12,500)

OBJECTIVES:

1. To educate Montana grain producers on the basics of risk management and marketing agricultural products, including basis and cash price determination.

2. To educate Montana grain producers in the use of computer software for the purposes of risk management and market planning.

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TTITLE: Evaluation of Barley for Resistance to Barley Yellow Streak Mosaic (BaYSM) Disease.

INSTITUTION: Montana State University

DEPARTMENT: Plant Pathology

RESEARCHERS: Tom Carroll (Leader)
Sue Brumfield
Jihad Skaf

FUNDED AMOUNT: ($10,000)

OBJECTIVES:

1. Complete the evaluation of the promising resistant barley genotypes from the 1000 entries of the barley core collection.

2. Evaluate the progeny derived from crosses made between the resistant genotypes and selected barley cultivars suitable for commercial production in Montana.

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TITLE: Economic Response of Dryland Spring Wheat to an Application of Nitrogen During the Tillering Stage.

INSTITUTION: Montana State University

DEPARTMENT: Agricultural Experiment Station

RESEARCHERS: Joyce L Eckhoff (Leader)
Gail Harper
Beverly Flynn
Christy Winter

FUNDED AMOUNT: ($3,150)

OBJECTIVES: 1. To determine the crop response and economics of an application of N during the tillering stage on dryland spring wheat following summer fallow.

2. To determine optimum, nitrogen management practices for spring wheat under dryland crop/fallow production.

3. To observe differences in response among varieties to N applied at different rates during tillering in a crop/fallow system.

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TITLE: Selection and Breeding for More Drought Tolerant Barley and Spring Wheat Cultivars and More Winterhardy Winter Wheat Cultivars.

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Hayden Ferguson

FUNDED AMOUNT: ($3,900)

OBJECTIVE:
To complete work on two of the objectives listed in the Montana Wheat and Barley Committee projects that was funded through June 30, 1991. These objectives were to;

1) adapt a "new" method of selection for drought resistant barley and spring wheat cultivars for use by plant breeders, and
2) adapt a "new" method of selection for winterhardiness of winter wheat cultivars for use by plant breeders.

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TITLE: Winter Wheat Breeding/Genetics

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Science

RESEARCHERS: Euegene A. Hockett
Rhoda Burrows

COOPERATORS: MAES Research Faculty, Charles McGuire, Jarvis Brown, Jack Martin, hayden Ferguson, Wendell Morrill, Greg Johnson, Don Mathre, Markeike Reinhold-Johnston

FUNDED AMOUNT: ($50,000)

OBJECTIVES:

1) Develop improved winter wheat varieties adapted to Montana's diverse growing conditions which meet domestic and export marketing requirements.

2) Test Montana and introduced winter wheat cultivars to obtain data for variety release and formulation of variety recommendations to growers.

3) Pursue wheat breeding, genetics and other research related to winter wheat variety development.

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TITLE: Development and Evaluation of Strategies for Management of Russian Wheat Aphid in Montana

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Science

RESEARCHERS: Greg Johnson (Leader)
Luther Talbert
Eugene Hockett
Tom Blake

FUNDED AMOUNT: ($60,000)

OBJECTIVES:

1) Cereal Breeding Programs

A. Develop resistant spring and winter wheat varieties that are adapted to Montana (Talbert and Hockett).

B. Introgression of genes conferring RWA resistance into well-adapted barley populations and field testing of these lines and populations (Blake).

2) Entomological Investigations

A. Compare the seasonal performance of selected insecticides for RWA control (Johnson and Kammerzell).

B. Determine the influence of RWA on wheat plants grown in three different soils under three different soil moisture regimes (Johnson and Kammerzell).

C. Provide timely information through the RWA Hotline to grain producers on the status of this pest in Montana (Johnson and Kammerzell).

3) Biological Control - Entomology

A. To augment and release exotic parasitoids and to determine their establishment and impact (Littlefield).

B. Determine dispersal of parasitoids within fields and determine their spatial distribution at varying population levels (Littlefield).

C. Determine factors which influence host seeking behavior of aphid parasitoids (Littlefield and Weaver).

D. Monitor the relative abundance of the RWA and associated natural enemies in winter wheat and spring barley and validate sampling plans developed for these insects from information obtained in previous years (Nowierski, Feng, Scharen and Sands).

4) Biological Control - Plant Pathology

A. Survey wheat and barley fields for the presence of entomophthoralean fungi (Nowierski and Feng).

B. Encapsulate the aphid specific fungi, Pandora neoaphidis and Conidiobolus obscuras in attempts to develop a long shelf life of the fungus for field inoculations (Sands,Feng and Scharen).

C. Examine field efficacy of P. neoaphidis and C. obscuras against RWA (Feng, Sands and Scharen).

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TITLE: Genetics of Resistance to Tan Spot in Winter Wheat

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: John M. Martin (Leader)
Robert H Johnston
Gene Hockett (Cooperator)

FUNDED AMOUNT: ($5,000)

OBJECTIVE:
Determine the genetics of resistance to tan spot in winter wheats which have been reported to have some resistance to

this disease.

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TITLE: Support For Seminar Speakers

INSTITUTION: Montana State University

DEPARTMENT: Plant Pathology

RESEARCHER: Tom McCoy

FUNDED AMOUNT: ($2,000)

OBJECTIVE:
To provide support for visiting scientists to speak and visit with faculty, staff, and students interested in agricultural research.

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TITLE: Equipment Acquisition

INSTITUTION: Montana State University

DEPARTMENT: Cereal Quality Laboratory

RESEARCHERS: Charles McGuire (Leader)
Eugene Hockett (Cooperator)
Luther E. Talbert (Cooperator)

FUNDED AMOUNT: ($29,100)

OBJECTIVE: Update of Cereal Quality Laboratory Equipment

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TITLE: Wheat Stem Sawfly and Cereal Leaf Beetle Management in Wheat and Barley

INSTITUTION: Montana State University

DEPARTMENT: Entomology

RESEARCHERS: Wendell Morrill (Leader)
Gene Hockett
Greg Kushnak
David Wichman
Gary Jensen
Charles McGuire
Jarvis Brown
James Gabor

FUNDED AMOUNT: ($26,876)

OBJECTIVES:

1) Wheat Stem Sawfly Management

A. Evaluate resistance of winter wheat/spring wheat crosses in cooperation with Gene Hockett.

B. Measure the effect of fall tillage of sawfly infested stubble on overwinter sawfly survival, with David Wichman.

C. Evaluate sawfly resistance in winter wheat lines at Conrad, with Greg Kushnak and Gene Hockett.

D. Test planting rate and date of spring wheat on sawfly damage, with Greg Kushnak.

E. Characterize sawfly resistance in oats and native grasses.

2) Cereal Leaf Beetle Management

A. Measure the effect of various infestation rates of larvae on malting barley yield and quality, with Charles McGuire and Jarvis Brown.

B. Import and release parasites from Utah, with Gary Jensen.

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TITLE: Value Enhancement of Barley as a Food and Feed Grain With the Object of Meeting Market Demands.

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Science

RESEARCHERS: R.K. Newman (Leader)
C.W. Newman (Leader)
Petrea Hofer
Kibbie Horsley
Jill Abbott
Karen Ore
Alan Danielson
Qi Xue
Linji Wang
Ragothaman Ramachandran

FUNDED AMOUNT: ($80,000)

OBJECTIVES:

1) To assay barley cultivars which are adapted to the various Montana environments, to determine the most desirable end usage by the food and feed industries.

2) To analyze and test milling and air classification fractions of selected barley cultivars for suitability for food industry ingredients.

3) To develop and evaluate products of extrusion processing in cooperation with the Northern Crops Institute (NCI).

4) To conduct a controlled human clinical trial to demonstrate the healthful benefits of barley in the diet.

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TITLE: Development of Rust Resistant Wheat and Barley Germplasm for Montana.

DEPARTMENT: Montana State University

INSTITUTION: Plant Pathology

RESEARCHERS: Mareike Reinhold-Johnston (Leader)
Luther Talbert
Eugene Hockett
Thomas Blake

FUNDED AMOUNT: ($19,260)

OBJECTIVES:

1) Evaluate wheat and barley cultivars and breeding lines currently grown in Montana for resistance to stem rust.

2) Establish screening nurseries to provide breeding programs with new sources of resistance.

3) Monitor naturally occurring races of stem rust in Montana.

4) Continue resistance screening for stripe rust of barley.

5) Study epidemiology of barley stripe rust as related to Montana growing conditions.

6) Collect and preserve large amounts of inoculum for establishment of screening nurseries and greenhouse work.

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TITLE: Bare Patch of Cereals - A Threat To Cereal Production

INSTITUTION: Montana State University

DEPARTMENT: Plant Pathology

RESEARCHERS: Jack Riesselman (Leader), Don Mathre (Leader)

FUNDED AMOUNT: ($10,000)

OBJECTIVES:

1) Determine which organisms are associated with stunted plants in barley and wheat in dryland and irrigated situations in various Montana locations.

2) Determine the effect of cropping practices including tillage,seeding dates etc., on the incidence of stunted plants and the severity of bare patch.

3) Determine the interaction of Rhizoctonia and other pathogens with various herbidides in relation to timing of seeding and herbicide application.

4) Determine potential strains and virulence patterns of Rhizoctonia isolates found in Montana.

5) Determine the effect of moisture stress on severity of disease caused by these pathogens.

6) Determine if grassy weeds play a role in the epidemiology of the disease.

7) Determine if residue potentially plays a role in disease development.

8) Design effective disease management practices for Montana producers.

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TITLE: Request for Partial Support for Purchase of Plot Harvester Combine.

INSTITUTION: Montana State University

DEPARTMENT: Agricultural Experiment Station/Huntley, MT

RESEARCHERS: Gil Stallknecht (Leader)
Ken Gilbertson
Rick Engel

FUNDED AMOUNT: ($18,000)

OBJECTIVE:

To purchase a new plot harvester combine, to replace a 1976 Hege combine.

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TITLE: Spring Wheat Breeding and Genetics

INSTITUTION: Montana State University

DEPARTMENT: Plant & Soil Sciences

RESEARCHERS: Luther Talbert (Leader)
Susan Lanning
Glenn Magyar
M. Aslam Hayat
Eric Storlie
Ipsita Sarkar

FUNDED AMOUNT: ($50,000)

OBJECTIVES:

1) To develop superior spring wheat varieties for Montana.

2) To manage the varietal testing program for spring wheat in Montana.

3) To improve end-use quality of Montana spring wheat.

4) To improve basic knowledge and efficiency of spring wheat breeding and genetics.

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TITLE: Evaluation of Various Materials and Practices Contributing Toward Economic Crop Production Under Flexible, Continuous and Other Cropping Systems in Montana.

INSTITUTION: Montana State University

DEPARTMENT: Research Centers

RESEARCHERS: Various

FUNDED AMOUNT: ($42,000)

OBJECTIVES:

1) To evaluate the effects of differing systems on crop variety performance under the diverse environments represented across the Montana Research Center network.

2) To evaluate the potential fit of other materials, concepts and techniques with various cropping systems employed.

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TITLE:

INSTITUTION: Western Plant Breeders

RESEARCHERS:

AMOUNT FUNDED: $13,100.00

OBJECTIVES:

This project funding pays $3,200 in MSU testing fees to aid in the development of a high-yielding, semi-dwarf feed barley and to evaluate two-rowed and six-rowed, waxy hulless barleys adapted to Montana growing conditions. It also funds $9,900 in MSU testing fees to aid in the development of high quality spring wheat cultivars, a sawfly resistant spring wheat, a semi-dwarf spring durum, and Russian wheat aphid resistant cultivars for Montana release.

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TITLE: Enhancement of National Wheat Research Development

INSTITUTION: NAWG Foundation

DEPARTMENT:

RESEARCHERS:

AMOUNT FUNDED: $2,000.00

OBJECTIVES:

The establishment of a coalition of state wheat commissions for the purpose of generating funds to support national research and/or educational projects is the objective of this project. Examples of areas to be considered include wheat utilization development such as use of wheat starch granules in biodegradable plastics, pharmaceutical tableting, cosmetics, fat replacement in food, and other new, industrial uses for wheat.

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INSTITUTION: Northern Tractor Resource Center

DEPARTMENT:

RESEARCHERS:

AMOUNT FUNDED:15,000

OBJECTIVES:

The objectives of the Resource Center are to continue development of the Center and to explore specific producer needs that the Center could address through its testing facilities, i.e. assessment of in-field tractor performance and efficiency problems such as ballasting, proper tire pressure, and resolutions to wheel slippage, premature parts wear, and fuel consumption. The Center also plans to conduct seminars to educate producers on how to improve tractor performance.